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TITLE OF THE INVENTION

Image Information Retrieving Device

ABSTRACT

[Object]　　To shorten a time from a retrieving process of image information that a user requires to a reading process, to perform a reproducing operation of image information immediately when the user indicates reading of desired image information, and to speed up an image reading process as a result of the above operation.

[Constitution]　　The device comprises: a retrieval file 109 in which retrieval information, and image attribute information of image information are recorded; a retrieval file recording/reproducing section 110 which records and reproduces information of the retrieval 109; and an image attribute reproducing section 111 which reproduces the image attribute

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information from the retrieval file 109, wherein the retrieval file recording/reproducing section 111 retrieves the retrieval file 109, retrieves the retrieval requirements that the user specifies and generates a retrieval result list, and the image attribute information required to read out the image information is reproduced before the user selects and indicates the desired image information from the retrieval result list to be displayed.

CLAIMS

[Claim 1]   An image information retrieving device which associates image information with retrieval information to register the image information and retrieval information, and retrieves desired image information from among plural items of image information registered by employing said retrieval information, said image information retrieving device comprising:

a retrieval file which, when said image information is registered, stores retrieval information added to be discriminated for each item of the image information and retrieval information consisting of corresponding image attribute information for each item of the image information;

a retrieval file recording/reproducing section which records/reproduces said retrieval file;

an image attribute reproducing section which reproduces said image attribute information from said retrieval file; and

a system control section which retrieves said retrieval

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file by said retrieval file recording/reproducing section, retrieves retrieval information that meets a retrieval condition specified by a user, generates a retrieval result list thereof, and when generation of said retrieval result list is completed, immediately reproduces image attribute information required to read out said image information.

DETAILED DESCRIPTION OF THE INVENTION

[0001]

[Field of Industrial Use]

The present invention relates to an image information retrieving device capable of retrieving and reading out desired image information from among plural items of registered image information (image).

[0002]

[Prior Art]

With a current increase in information amount, rationalization of business processing, and a tendency for reduction of paper work, there is practically used an image information retrieving device for reading a manuscript such as documents or drawings, compressing the read image information, thereby storing a large capacity storage medium such as optical disk, retrieving image information stored in the storage medium as required, and displaying or printing out it. For example, there is provided an "optical disk filing system; SOF-FS21" available from Sanyo Electric Co., Ltd., for example.

[0003]

Retrieval of image information in such an image information retrieving device is generally performed as follows.

[0004]

First, a user inputs a retrieval condition on a retrieval, and instructs execution of retrieval. By the instruction for executing retrieval, image information meeting the retrieval condition is retrieved, and the result is displayed as a list of the documents (retrieval result list). Next, the user selects desired image information from the displayed retrieval result list, and instructs execution of readout. By such an instruction of execution of readout, attributes such as image information record address, data length, image size, and resolution are reproduced, image information is reproduced from a recording medium based on the image attribute information, and the information is displayed.

[0005]

Image information retrieval of this type is disclosed in Jpn. Pat. Appln. KOKAI Publication No. 3-154967 and the like, and is publicly known.

[0006]

[Object of the Invention]

As described above, in a conventional image information retrieving device, when image information is read out, a user selects desired image information from a retrieval result list. At the time of instructing readout, image attribute information

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corresponding to the image information is reproduced, and image information is reproduced and displayed based on the reproduced image attribute information.

[0007]

Therefore, in the image information retrieving device, it is very important how speedily image information that the user desires can be reproduced and read out, and speedy retrieval processing and readout processing are strongly demanded.

[0008]

In actuality, in the case of retrieving through the retrieval processing process described above, it takes a certain period of time for a user to select readout image information after the retrieval result list is displayed and instruct the readout since the user checks the retrieval result list and finding out desired image information. During this period, a control system of the image information retrieving device enters a state of waiting for image selection by user, does not have processing to be performed, is in a so called idle state, and has wastefulness in time in view of the control system.

[0009]

It is an object of the present invention to provide an image information retrieving device capable of shortening a time from a retrieving process of image information that a user requires to a reading process, performing a reproducing operation of image information immediately when the user

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indicates reading of desired image information, and speeding up an image reading process as a result of the above operation.

[0010]

[Means for Achieving the Object]

According to the present invention, there is provided an image information retrieving device which associates image information with retrieval information to register the image information and retrieval information, and then retrieves desired image information from among plurality items of image information registered by employing the retrieval information, the image information retrieving device comprising:

a retrieval file which, when said image information is registered, stores retrieval information added to be discriminated for each item of the image information and image attribute information comprising image information record address, data length, image size, and resolution for each item of the image information;

a retrieval file recording/reproducing section which performs recording/reproduction for the retrieval file; and

an image attribute reproducing section which reproduces the image attribute information from the retrieval file, wherein

the retrieval file recording/reproducing section retrieves the retrieval file, retrieves retrieval information that meets a retrieval condition specified by a user, generates a retrieval result list thereof, and when generation of the retrieval result list is completed, immediately reproduces

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image attribute information required to read out the image
information before the user selects and indicates the desired
image information from the retrieval result list to be
displayed.

[0011]

[Function]

In the present invention, a user selects image
information to be read out after a retrieval result list is
displayed, and reproduces image attribute information of image
information which is displayed in the retrieval result list
while an idle state is established until the user instructs
readout of the image information. In this manner, when the user
instructs readout of desired image information, attribute
information of the image information has already been acquired,
reproducing operation of image information can be performed
immediately, thereby making it possible to speed up an image
readout processing speed.

[0012]

[Embodiments]

Hereinafter, an image information retrieving device
according to one embodiment of the present invention will be
described referring to the accompanying drawings.

[0013]

FIG. 1 is a block diagram depicting an image information
retrieving device in one embodiment of the present invention.
FIG. 2 is a schematic view showing a retrieval file record format
in the image information retrieving device according to the

embodiment of the present invention. FIG. 3 is a schematic view showing a retrieval screen in the image information retrieving device according to the embodiments of the present invention. FIG. 4 is a schematic view showing a retrieval result list screen in the image information retrieving device according to the embodiments of the present invention. FIG. 5 is a flow chart showing procedures for retrieval/readout processing in the image information retrieving device according to the embodiment of the present invention. FIG. 6 is a flow chart showing operating procedures for an image attribute reproducing section in the image information retrieving device according to the embodiment of the present invention.

[0014]

In FIG. 1, to main control means 1, there are connected: a scanner 2 for optically scanning and reading image information to be inputted, and converting the information into dot data; a CRT display 3 for performing control display and output display; a re-write type (additional description type) optical disk 4 for storing data such as image information; a keyboard 5 for a user to perform key input; a mouse 6 used as a pointing device; and the like.

[0015]

The main control means 1 comprises: a system control section 101; a scanner I/F circuit 102; a display memory 103; a display control section 104; a compressing/decompressing section 106; a buffer memory 107; an optical disk storing/reproducing section 108; an image memory 105; a

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retrieval file 109; a retrieval file recording/reproducing
section 110; and an image attribute reproducing section 111.
The system control section 101 is composed of microcomputers
or the like for performing a variety of controls, includes a
memory or the like for storing the control procedures of FIGS.
5 and 6, and performs a variety of controls. The scanner I/F
circuit 102 controls an interface with the scanner 2. The
display memory 103 stores data such as image information to
be outputted and displayed on the CRT display 3 and control
information. The display control section 104 controls data
such as image information stored in the display memory 103 so
as to be displayed on the CRT display 3. The
compressing/decompressing section 106 performs
compression/decompression of data such as image information
written in or read out from the rewrite type optical disk 4.
The buffer memory 107 temporarily stores data such as compressed
image information before decompressed or compressed. The
optical disk storing/reproducing section 108 performs
storage/reproduction operation for the optical disk 4. The
image memory 105 temporarily stores one item of image
information inputted by the scanner 2, or alternatively,
temporarily stores data such as image information read from
the optical disk 4. The retrieval file 109 records retrieval
information such as title inputted by the user during
registration of image information or keywords and image
attribute information such as record address of registered
image information, data length, image size, or resolution. The

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retrieval file recording/reproducing section 110

records/reproduces the retrieval file 109. The image

attribute reproducing section 111 reproduces image attribute

information from the retrieval file 109 based on an instruction

of the system control section 101.

[0016]

In the retrieval file 109, there are recorded: retrieval

information such as title inputted by the user during

registration of image information or keywords; and image

attribute information such as record address of registered

image information, data length, image size, or resolution. The

record format is as shown in FIG. 2.

[0017]

In addition, the user types the keyboard 5, or

alternatively, operates the mouse 6 that is a pointing device,

thereby driving and controlling an information file device of

the present embodiment. Now, with respect to an image

information retrieving/readout control method in the thus

arranged image information retrieving device of the present

embodiment, operating procedures therefor will be described

with reference to FIGS. 2 to 6. In particular, the system

control section 101 has a memory or the like storing control

procedures of FIGS. 5 and 6, and is controlled in accordance

with a main program for controlling the entirety of the image

information retrieving device of the present embodiment.

[0018]

First, the user instructs start of a retrieval work by

the keyboard 5 and the mouse 6 (step S1). When the system control section 101 receives an instruction for starting a retrieval work, it reproduces the header part of a retrieval file 109 by the retrieval file recording/reproducing section 110 (step S2). When this header part reads image information to be inputted, it is written together with the image information. The number of retrieval information items and retrieval information names are recorded in the header part of the retrieval file 109.

[0019]

Now, assuming that the number of retrieval information items is 3, and the retrieval information names are "title", "date of registration", and "keyword", the retrieval screen data as shown in FIG. 3 is created, and the screen data is transferred to the display memory 103, thereby displaying the retrieval screen on the CRT display 3 (step S3).

[0020]

Next, the user inputs the retrieval condition by the keyboard 5 and/or mouse 6 on the retrieval screen as shown in FIG. 3 that has been displayed, and instructs execution of retrieval (step S4). When the system control section 101 having received the instruction for execution of retrieval reproduces a data part of the retrieval file 109 by the retrieval file recording/reproducing section 110 (step S5); and retrieves an image meeting the retrieval condition inputted in the step S4 (step S6). A set of record Nos. n of images meeting the retrieval condition is obtained by processing for

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retrieving the image meeting this retrieval condition (step S6).

[0021]

The system control section 101 creates a retrieval result list as shown in FIG. 4 based on a set of record Nos. n of images meeting the retrieval condition, and displays it on the CRT display 3 (step S7). Further, the system control section 101 outputs to the image attribute reproducing section 111 a set of record Nos. n of image information acquired by processing for retrieving images meeting the retrieval condition (step S6) at a time when creation and display of this retrieval result list terminates, and initiates the image attribute reproducing section 111.

[0022]

While the image attribute reproducing section 111 is initiated (step S8), the user performs processing for image selecting operation irrespective of such initiation (step S9)

[0023]

On the other hand, the image attribute information reproduction processing described later, by the image attribute reproducing section 111 is performed in parallel to processing for the image selecting operation (steps S15 to S20 of FIG. 6). The processing for the image selecting operation includes processing for inverting and displaying No. n of the selected image information if the user has selected image information to be read out by the mouse 6 (if the inverse display has already been achieved, the display is restored to be in

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a deselected state); and processing for transferring control thereof in the next step S10 if execution of readout is instructed by the user.

[0024]

When the image attribute reproducing section 111 is initiated by the system control section 111 (step S15), the data part of the retrieval file 109 is reproduced by one image via the retrieval file recording/reproducing section 110 based on record Nos. n of image information received during initiation, and the image attribute information (record address, data length, image size, resolution) is stored in an memory provided therein to be associated with record Nos. n of image information (step S16). Next, the image attribute reproducing section 111 checks whether or not there is a request for image attribute information (processing in the step S10 of FIG. 5) from the system control section 101 (step S17). The image attribute reproducing section 111 proceeds to the step S18 if there is no request from the system control section 101, cancels reproduction processing for image attribute information, and proceeds to the step S20 if there is a request.

[0025]

In the step S18, the image attribute reproducing section 111 determines whether or not image attribute information has been reproduced for all the image information items given in step S15. If reproduction has terminated for all the images, it proceeds to the step S19. Otherwise, it returns to the step S16 in which image attribute information is reproduced for the

next image information. If the image attribute information

corresponding to all the image information items has been

reproduced, it waits for a request for image attribute

information from the system control section 101 (processing

in the step S10 of FIG. 5) in the step S19.

[0026]

In the system control section 101, when processing for

executing readout is instructed by the user, it proceeds to

the step 10 of FIG. 5. Then, Nos. n of the images selected by

the user are outputted to the image attribute reproducing

section 111, and information attribute information is

requested for the image information.

[0027]

The image attribute reproducing section 111 having

received the request from the system control section 101

reproduces from an internal memory the image attribute

information for the specified image Nos. n, and outputs it to

the system control section 101. When this request is received,

if reproduction processing of the image attribute reproducing

section 111 is not completed, information representative of

"attribute information regeneration" is outputted instead of

image attribute information with respect to image information

obtained when image attribute information is not reproduced

for image information specified by the system control section

101 (in FIG. 6, when the steps S17 to S20 are proceeded).

[0028]

The system control section 101 having acquired image

attribute information in the step S10 performs image

information readout/reproduction processing in the steps S11

to S14.

[0029]

In the steps S11 and S12, it is checked whether or not

the image attribute information corresponding to image

information for performing readout is returned by the image

attribute reproducing section 111 (step S11). If the

"attribute information not reproduced" is returned, the image

attribute information in the retrieval file 109 is reproduced

by the retrieval file recording/reproducing section 110 (step

S12).

[0030]

In the step S13, based on the acquired image attribute

information (record address, data length, image size,

resolution), image information is outputted to the buffer

memory 107 by the optical disk 4 via the optical disk

recording/reproducing section 108, an instruction is supplied

to the compressing/decompressing section 106, the reproduced

image information is decompressed and written into the image

memory 105. Further, the information is transferred to the

display memory 103, whereby image information is displayed on

the CRT display 3. In the step S14, it is determined whether

or not readout processing terminates for all the image

information selected by the user. When image information to

be read out remains, it returns to the step S11. When all the

readouts has terminated, retrieval/readout processing

terminates.

[0031]

In this manner, in the present embodiment, when reproduction processing of the image attribute reproducing section 111 is not completed, in the case where the execution of readout is instructed by the user, and the system control section 101 proceeds to the step S10 of FIG. 5, there is a case where the image attribute reproducing section 111 does not reproduce the image attribute information for the image information instructed by the user, and the system control section 101 must reproduce the image attribute information directory in the step S12. However, in actuality, a certain amount of time (several seconds at the earliest) is required for the user to select image information to be read out in the step S9 of FIG. 5. In general, during this period, processing of the image attribute reproducing section 111 is fully completed.

[0032]

In this manner, the image information retrieving device according to the present invention associates image information with retrieval information to register the image information and retrieval information, and then, retrieves desired image information from among plural items of image information registered by employing the retrieval information, the image information retrieving device comprising:

a retrieval file 109 which, when the image information is registered, stores retrieval information added to be

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discriminated for each item of the image information and retrieval information consisting of corresponding image attribute information for each item of the image information;

a retrieval file recording/reproducing section 110 which performs recording/reproduction for the retrieval file 109;

an image attribute reproducing section 111 for reproduces the image attribute information from the retrieval file 109; and

a system control section 101 which retrieves the retrieval file 109 by the retrieval file recording/reproducing section 110, retrieves retrieval information that meets a retrieval condition specified by a user, generates a retrieval result list thereof as shown in FIG. 4, and when generation of the retrieval result list is completed, immediately reproduces image attribute information required to read out the image information.

[0033]

Therefore, the retrieval file 109 is retrieved by the retrieval file recording/reproducing section 110, and image information meeting the retrieval condition specified by the user is retrieved. The retrieval result list as shown in FIG. 4 is generated. At a time when the generation of the retrieval result list has been completed, the image attribute reproduction par 111 is operated. Then, while the user selects and specifies desired image information from the displayed retrieval result list shown in FIG. 4, the image attribute information required to read out the image information can be

reproduced.

[0034]

Hence, during a period when the use selects image information to be read out after displaying the retrieval result list shown in FIG. 4, and instructs readout of the image information, it is possible to reproduce the image attribute information of the image information displayed in the retrieval result list. In this manner, when the user instructs readout of desired image information, the attribute information of the image information has already been acquired. Thus, reproduction operation of the image information can be performed immediately, and speedy image readout processing velocity can be achieved.

[0035]

In the meantime, the retrieval file of the above embodiment is provided as the retrieval file 109 which, when image information is registered, retrieves the retrieval information added to be discriminated for each item of image information and the retrieval information consisting of the corresponding image attribute information for each item of the image information. However, in the case of implementing the present invention, there may be provided a file for, when the image information is registered, storing the retrieval information added to be discriminated for each item of the image information and the retrieval information consisting of the corresponding image attribute information for each item of the image information.

[0036]

In addition, in the above embodiment, the retrieval information such as titles or keywords inputted by the user during registration of image information and the image attribute information such as record address of registered image information, data length, image size, and resolution are recorded as one retrieval file 109. These items of information may be recorded to be divided into two files, i.e., retrieval file and image attribute information file.

[0037]

The retrieval file recording/reproducing section of the above embodiment is provided as the retrieval file recording/reproducing section 110 for performing recording/reproduction for the retrieval file 109. However, in the case of implementing the present invention, writing and readout for the retrieval file 109 may be performed.

[0038]

Further, the image attribute reproducing section of the above embodiment is provided as the image attribute reproducing section 111 for reproducing the image attribute information from the retrieval file 109. In the case of implementing the present invention, this reproducing section can be common to the retrieval file recording/reproducing section 110 for performing recording/reproduction for the retrieval file 109.

[0039]

Furthermore, the system control section of the above embodiment retrieves the retrieval file 109 by the retrieval

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file recording/reproducing section 110, retrieves the retrieval information meeting the retrieval condition specified by the user to generate the retrieval result list as shown in FIG. 4. In addition, there is provided the system control section 101 for, when the generation of the retrieval result list is completed, reproducing the image attribute information required to read out the image information. However, in the case of implementing the present invention, the image information meeting the retrieval condition specified by the user is retrieved, and the retrieval result list is generated according to the retrieval result. At a time when the generation has been completed, while the image attribute reproducing section 111 is operated, and the user selects and specifies desired image information from the displayed retrieval result, the image attribute information required to read out the image information may be reproduced.

[0040]

[Advantages of the Invention]

As described above, according to the image information retrieving device of the present invention, there is provided the system control section for retrieving the retrieval file by the retrieval file recording/reproducing section, retrieving the retrieval information meeting the retrieval condition specified by the user to generate the retrieval result list, and when the generation of the retrieval result list is completed, reproducing the image attribute information required to read out the image information immediately. Thus,

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during a period when the user selects the image information to be read out after displaying the retrieval result list and instructs readout thereof, the image attribute information of the image information displayed in the retrieval result list is reproduced by background processing. In this manner, at a time when the user instructs readout of desired image information, the attribute information of the image information is already acquired. Thus, reproduction operation of image information can be performed immediately, and speedy image readout processing can be achieved.

BRIEF DESCRIPTION OF THE DRAWINGS

[FIG. 1]

FIG. 1 is a block diagram depicting an entire arrangement in an image information retrieving device according to one embodiment of the present invention.

[FIG. 2]

FIG. 2 is a schematic view showing a record format of a retrieval file in the image information retrieving device according to one embodiment of the present invention.

[FIG. 3]

FIG. 3 is a schematic view showing a retrieval screen in the image information retrieving device according to one embodiment of the present invention.

[FIG. 4]

FIG. 4 is a schematic view showing a retrieval result list screen in the image information retrieving device according

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to one embodiment of the present invention.

[FIG. 5]

FIG. 5 is a flow chart showing procedures for retrieval/readout processing in the image information retrieving device according to one embodiment of the present invention.

[FIG. 6]

FIG. 6 is a flow chart showing operating procedures for an image attribute reproducing section in the image information retrieving device according to one embodiment of the present invention.

Explanation of Reference Numerals

1 Main control means

2 Scanner

3 CRT display

4 Optical disk

5 Keyboard

6 Mouse

101 System control section

109 Retrieval file

110 Retrieval file recording/reproducing section

111 Image attribute reproducing section

FIG. 1

6 Mouse

5 Keyboard

2 Scanner

109 Retrieval file

110 Retrieval file recording/reproducing section

111 Image attribute reproducing section

101 System control section

102 Scanner I/F circuit

105 Image memory

103 Display memory

3 CRT display

104 Display control section

106 Compressing/decompressing section

107 Buffer memory

108 Optical disk recording/reproducing section

4 Optical disk

FIG. 2

Header part

Number of recording images (L)

Number of recording bytes per image (M)

Number of retrieval information items per image (N)

Number of recording bytes per image (1)

Retrieval information name (1)

Number of recording bytes of retrieval information (N)

Retrieval information name (N)

Data for one item of retrieval information

Data part

Record address (1)

Data length (1)

Image size (1)

Resolution (1)

Retrieval information 1 (1)

Retrieval information N (1)

Attribute information for one image

Retrieval information for one image

Data for one image (M bytes)

Data part

Record address (LL)

Data length (LL)

Image size (L)

Resolution (L)

Retrieval information 1 (L)

Retrieval information N (L)

FIG. 3

Input

Print

Register

Retrieve

[Retrieve]

-Retrieval condition-

1. Title

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2. Date of registration

3. Keyword

Input retrieval condition, and select "Execute".

[Execute]

[Cancel]

FIG. 4

Input

Print

Register

Retrieve

[Retrieval result list]

<Previous page>

<Next page>

Title

1. Block diagram of image information retrieving device

2. Retrieval file format

3. Example of retrieval screen

4. Example of retrieval result list

5. Procedures for retrieval/readout processing

[Execute]

[Cancel]

FIG. 5

Retrieval/readout processing

S1 Use's instruction of start of retrieval work

S2 Reproduce header part of retrieval information file

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S3 Display retrieval screen

S4 User's input of retrieval condition and instruction of execution of retrieval

S5 Reproduce data part of retrieval information file

S6 Obtain image meeting inputted retrieval condition

S7 Generate and display retrieval result list

S8 Initiate image attribute reproducing section

S9 Use's selection of desired image and instruction of execution of readout

S10 Acquire attribute information of readout image by image attribute reproducing section

S11 Image attribute information

Present

Absent

S12 Obtain image attribute information

S13 Reproduce and display image information by optical disk

S14 End of readout?

End

FIG. 6

Operate image attribute reproducing section

S15 Initiation by system control section (Image No. is assigned)

S16 Reproduce image attribute information based on image No.

S17 Request from system control section

Present

Absent

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S18 End of reproduction?

S19 Wait for request from system control section

S20 Return image attribute information requested from system control section

End